Mezzo Software Suite

Noise Monitor Module

User Guide - v2.3

2023-02-01



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1 Introduction

Congratulations on your purchase of the Mezzo Noise Monitor Module.

The Noise Monitor Module offers state-of-the-art long-term monitoring. The module can not only monitor noise but also 3-axis vibration, overpressure and several other sensors (power, weather, camera, traffic, GPS, dust and gas). The Noise Monitor Module is now the one stop monitoring system that can do it all.

The Noise Monitor Module can be used with any of the Mezzo hardware family (Precision Microphone, Intensity Probe, 2ch Analyzer, 4ch Analyzer).

The current user guide describes the functionalities of the Noise Monitor Module. For more information on the Mezzo hardware or on other sensors, please refer to the user guide of the specific hardware.

2 Noise Monitoring Station System

The following figure illustrates the system components which are described in this section.

2.1 Computer

The PC is at the heart of the monitoring station. Of course, this PC needs to have the Noise Monitor Module installed.

Computer Requirements

Item	Minimum Requirements
Operating System	Windows 7 sp1, Windows 8.1, Windows 10
CPU	Dual-Core at 1.2 GHz
Memory	2 GB RAM
Hard Drive	500 MB free hard disk space
Port	USB 2.0
Minimal Display resolution	800 x 600

2.1.1 Networking

The Noise Monitor module features an optional extensive monitoring tool allowing to push data to the web. Hence, to get the full potential of this feature it is strongly recommended to use a computer providing a broadband wireless card (LTE WWAN).

2.1.2 Power Consumption

The computer is the most power demanding item from the whole system. Thus, its power requirements will be the most significant in the power estimation of the system. The power drained by a Mezzo unit is around 1W and the power drained by the whole monitoring system (Mezzo+PC+LTE) can be as low as 12W.

2.1.3 Sleep and Standby

It is strongly recommended to disable automatic sleep and automatic turn-off especially when using the system as a semi-permanent or permanent station. Please refer to Windows help to get more information on this topic.





2.2 Sound Level Meter

To measure the sound (Sound Level Meter or SLM), a Mezzo unit and a SLM microphone are necessary. The Mezzo unit supports any IEPE compatible microphone. Recommended outdoor microphones are GRAS type 41AL-S1 and BSWA type OM231.

2.3 Vibrations

2.3.1 Vibrations using a Mezzo

Capitalizing on the 4 channels of the Mezzo 4ch Analyzer, the module is capable of monitoring noise (channel 1) and also 3-axis vibration (channels 2, 3 and 4).

The Mezzo unit supports any IEPE compatible accelerometers. A 3-axis accelerometer is recommended (ICP accelerometer from PCB Piezotronics or 100 Series from Visong Test). The vibration velocity is integrated from the measured acceleration.

Alternatively, an analogic geometer can be used as vibration inputs. Soft dB offers 2 models. The AG01 is specialized for DIN measurements (1-80Hz) and the AG02 is specialized for ISEE measurements (2-250Hz). Since analog geometers are passive components, special care should be taken to configure the Mezzo in the geophone mode before connecting the sensor to it. Failure to do so, may cause damage to the geophone as it will inject a current into the geophone coil. Notice that activating the Mezzo+Geophone mode will necessarily disable the IEPE power on all inputs including the input 1 which is usually reserved for the SLM.

2.3.2 Vibrations using the smartVib sensor

Soft dB has developed the smartVib which is a precise and rugged embedded 3-axis acceleration sensor that can be linked to a computer through a single communication cable. The sensor outputs the measured acceleration and integrated velocity and transfers the data digitally to the computer.

2.3.3 Vibrations using the smartGeo sensor

Soft dB has developed the smartGeo which is a precise and rugged embedded 3-axis geophone sensor that can be linked to a computer through a single communication cable. The sensor outputs the measured velocity and transfers the data digitally to the computer.

2.4 Overpressure

The overpressure (OPL) aims at measuring the aerial blow caused by a blasting event. It is usually measured along with the vibration data. The nature of the overpressure implies a lower frequency range and a higher level than usual SLM measurements. For that reason, a specialized microphone such as the ZT-341 from Z-Tech should be used.

2.5 Outdoor Camera

The Noise Monitor Module features a snapshot tool to take pictures periodically and/or triggered by noise exceedance events. A proprietary USB camera specially housed for outdoor use of an IP camera can also be used (model HikVision DS-2CD2032-I or PCB-B15Z2S).

2.6 Weather

The Noise Monitor Module features extensive weather logging. The smartWeather sensor is recommended for its simplicity and affordability. The station being powered trough the communication cable, no battery is necessary.

The software is also compatible with two weather meter models from Davis Instruments: the VantagePro2 (Davis #6152) or the Vantage Vue (Davis #6150). Both stations require the WeatherLink USB Data Logger (Davis #6510USB) to connect the weather console to the PC.

2.7 Charge Controller

The Noise Monitor Module features power monitoring and warnings. This feature is compatible with the EpSolar Tracer Series charge controller (refer to EpSolar website for more information). The controller can be used as a solar charger but also as a simple battery gauge. A Soft dB proprietary cable is required to communicate with the charger (USB to UART RJ45).

2.8 Traffic Radar

The Noise Monitor Module features traffic statistics capabilities. This feature is compatible with the radar Stalker Traffic Statistics Sensor. Using the radar, the software can monitor the traffic and record statistics on the number and speed for five sizes of vehicles in both directions. Refer to the Stalker website for more information on the radar. A proprietary cable can adapter can power the radar and manage the communication (USB to serial).

2.9 Dust

The Noise Monitor Module features dust monitoring capabilities. This feature is compatible with the Met One ES-642 Remote Dust Monitor. Refer to the Met One Instruments website for more information. The dust sensor communicates using a proprietary adapter that plugs into a USB port of the computer. Since the dust sensor can be power consuming it is recommended to power the station externally.

2.10 Gas

The Noise Monitor Module features gas monitoring capabilities which is compatible with the UniTec Sens-IT gas sensors. Using the gas sensors, the software can monitor the polluting gases (CO, NO₂, O₃, CH₄, NO_X, C₆H₆, H₂S and SO₂). Refer to the UniTec website for more information. The dust sensor communicates using a proprietary adapter that plugs into a USB port of the computer. Since the gas sensors can be power consuming it is recommended to power the station externally.

3 Mezzo Noise Monitor Module

The Mezzo Noise Monitor measurement module is part of the Mezzo Software Suite. Combined with a Mezzo hardware, the Noise Monitor module covers all basic and advanced features for a professional sound level meter. By adding a vibration sensor and an overpressure microphone, the module also become a complete meter for blast surveillance or general vibration monitoring. The compatibility with several other sensors (power, weather, camera, traffic, GPS, dust and gas) makes this module ideal for general environmental monitoring.



Main interface of the Noise Monitor Module

General Module Specifications

Parameter	Value
Time period	Up to 4 independent averaging periods from 1 second to 24 hours. Live data shows the instant levels (available only during measurement, not recorded).
SLM Data	The noise measurement is the core of the module. Complies with IEC 61672 (2013) Class 1 standard for sound level meters. Time weighting: Slow, Fast or Impulse. Frequency weighting: A, C and Z. Global levels, 1/3 octave spectrum and FFT spectrum. Live: SPL, Peak, live Leq. Average data: SPL Stats (Lmin, Lmax and selected LN%), Peak max, Leq, Taktmax. 1/3 octave bandwidth: 12.5 Hz to 20 kHz. FFT bandwidth: 0 to 22 kHz.

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Vibration Data	The 3-axis vibration measurement is optional. Covers several major vibration standards for both human perception and building structure response: ANSI S2.71, ISO 2631, ASHRAE, DIN 4150-2, DIN 4150-3, USBM 8507. Acceleration and Velocity over 3 axes (X, Y, Z) and vector sum (V) Acceleration: peak, rms, Wm rms, Combined rms, 1/3 octave peak & rms, FFT rms Velocity: peak, rms, KBFmax, KBFTm, VB1/2/3 peak, 1/3 octave peak & rms, FFT rms Along with the global peak (Acc. Peak & Vel. Peak), the main frequency at the peak time is also evaluated. Along with the global rms (Acc. RMS & Vel. RMS), the main frequency of the average period is also evaluated. Average data can be displayed and recorded. Live data can only be displayed while measuring. 1/3 octave bandwidth: 0.5 Hz to 500 Hz. FFT bandwidth: 0 to 500 Hz.
OPL Data	The peak overpressure level of during period can be recorded. The displayed unit is dBL. Usually, the OPL is recorded along with the vibration for blast monitoring purposes.
Other Data	The Mezzo monitoring system can also record the data from other optional devices: Weather meter Solar charger Traffic radar Dust meter Gas meter
Events	Up to 4 independent events. Periodically or on trigger (including external trigger from another station). An event can include: • Audio record (wav or mp3) • Pictures from the camera (if any) • The main average SLM, OPL and vibration data during the event • The OPL and vibration waveforms during the event
Data record	Average data and events are added to the measurement file as they become available during the measurement.
Display	 Easy user selection of the data to be displayed. Configurable while measuring. Live or one of the 4 averaging periods. Time History, 1/3 Octave spectrum, FFT spectrum, Table or Vibration Graph. The main panel is scalable (smaller is 800 x 480 pixels). While measuring: Both live data and average data in progress are available. Occurring events are represented in the Event History Graph but cannot be accessed. While post-processing a measurement: The average data of the whole measurement are available. The events of the whole measurements can be accessed.

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	Messages can be sent to users using email. Power notifications:
	 Internal and external low battery.
	 Change of power source (battery vs AC).
Notifications	Level exceedance notifications:
Notifications	Up to 12 different data can be followed.
	 Either SLM, OPL, vibration, dust or gas data
	 A period among the 4 intervals available.
	 Data can be Global, Band, Band Emergence or Spectrum Curve
	 Each notification dans be filtered according to time of day and day of week.
	An optional monitoring service hosted by Soft dB is available.
	 Save the average data and events on a web server.
Monitoring	Real-time data on a secured web portal.
Service	Email notifications for online/online station status.
	Automatic daily reporting.
	Automatic seismic event reporting.
	Functions to export average data and events to Excel.
Miscellaneous	A viewer interface is available for every managed device (camera, weather, charger, traffic, position, dust, gas, smartVib, smartGeo).
	Automatically reconnect and restart a measurement if an error occurs.



3.1 File Menu

File	Display	Setup	Viewe	r			
Open	Open Previous	Open Next	Export	Export Multiple	() Info	Insert comment here	

File Menu tab

File Menu	
lcon	Description
Open	The Open button prompts the user to open data files (.menm). Several files can be loaded all at once given that the data setup of each file is identical. The software also supports the files generated by the Web Monitoring as a legacy feature. A measurement on the web is made of a directory that contains several data files (.dat) and a configuration file (<i>header.bin</i>). In order to load the measurement, the file <i>header.bin</i> has to be selected.
Open Previous Open Next	These two buttons open the previous/next data file in the Record Directory.
Export	This button opens the Export interface that sets both the average data and event data to be exported. The data are exported into tab delimited files (.txt), which can be easily opened with any spreadsheet application such as Microsoft Excel.
Export Multiple	This button prompts the user to select several files to be exported in a batch process. The same Export interface also sets the data being exported according to the setup of the first selected file. Each source file is exported into its own export files.
Info	This button opens the File Info interface (figure below). It contains the information on the measurement over several tabs: • General information (file details, GPS, computer, comment) • Sound Input setup (Mezzo info, microphone info & sensitivity, calib-check history) • Vib Input setup (Mezzo info, accelerometer info & sensitivity) • Interval Data setup • Event Data setup • Record Setup (record directory and file duration) • Web Monitoring Setup • Notifier Setup They are all indicators except for the comment, which can be modified either while measuring or once the measurement is completed. In the bottom left of the panel, the record rate and the remaining record duration are estimated.
Insert comment here	The comment field at the right of the Info button allows the user to view/edit the file comment without opening the File Info interface.

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M File Info										×
General	Sound Inp	put V	ib Input	Interval Data	Event Data	Record	Web N	Monitoring	Notifier	
File Details										
Mea	asure Start	t Time	2019/02	2/07 16:27:25		Measu	re Size	1,63 MB		
	File Start	t Time	2019/02	2/13 11:00:00	Me	asure Du	ration	139:10:10,9	931	
	File End	l Time	2019/02	2/13 11:37:36	Cá	ause of Fi	le End	Manual St	opped	
					S	oftware V	ersion	2.3.5		
GPS C	oordinate	es			C	omputer	Info			
1	atitude 4	16,7924	16	1.4m	Ν	/anufactu	urer To	be filled b	y O.E.M.	
Lo	ngitude -	71,231	062	E 1,4M	I,4m Model 1		del To	o be filled by O.E.M.		
	Altitude 5	=	±0,9m		Na	me AE	OVANTECH	16		
Comr	nent									
Current ev Case	Current event setup: 5,41 MB/hour (467,4days) Case no event: 1,44 MB/hour (1752days) OK Cancel									

File Info Interface



3.2 Display Menu



The data display on the main interface can be accessed from the Setup Menu tab.

Display Menu	
Icon	Description
Live Per1 S 30s Per3 1m	The Live mode displays the current level during the measurement. The Period modes (Per 1/2/3/4) displays the data level for the selected averaging period (period duration indicated in the lower part of the button). While acquiring the display can be toggled between Live and Period mode. Once the measurement is stopped, only the Period modes are available.
SLM OPL Vib Weather Traffic Dust Power Gas	Toggles between the available sensor types: • SLM microphone • OPL microphone • Vibration • Weather • Traffic radar • Dust monitor • Power Controller • Gas monitor
Image: Second	Toggles between available display types: Time History, 1/3 octave spectrum, FFT spectrum, Table and Vibration History.
SLM data	 Here is the data that may be available when the SLM sensor is selected: SPL, Peak, Leq or Taktmaximal (LTm5). Frequency weighting A, C or Z (no weighting). The A-weighting is the most common. The three weightings are evaluated in parallel in the time domain except for the spectrums, for which the dBA and dBC are obtained by applying the frequency weighting on dBZ spectrum. Max, Min or Stat selects the SPL statistic over the displayed average period. Max and min are respectively the highest and lowest SPL data read. The Stats button with the LN% selection, displays the percentile N% level.
OPL data	The only data that is available is the peak overpressure which is the maximum absolute level during a given period.





3.3 Setup Menu

File	Display	Setup	Vie	ewer				
SLM Input	OPL Vib Input	Interval Data	Event Data	Record	Web Monitor	Notifier	Import Setup	Export Setup

Setup Menu tab

The setup of the measurement can be accessed from the Setup Menu tab.

Setup Menu

lcon	Description
SLM Input	The SLM Input button calls the SLM Input Setup interface (p.11). It mainly sets the sensitivity and range of the sensor.
OPL Input	The OPL Input button calls the OPL Input Setup interface (p.11). It mainly sets the sensitivity, the range and the bandwidth of the sensor. The OPL setup should be set according the calibration tests completed in laboratory.
Vib Input	The Vib Input button calls the Vibration Input Setup interface (p.13). It mainly sets the sensitivity and range of the sensor.
Interval Data	The Data button calls the Interval Data Setup interface (page 18). It mainly sets the interval data to be evaluated and recorded.
Event Data	The Event Data button calls the Event Data Setup interface (page 25). It mainly sets when to record an event and what it will contain (audio, pictures, average, waveforms).
Record	The Record button calls the Record Setup interface (page 27). It mainly sets the record destination and the file management.
Web Monitor	The Web Monitor button calls the Web Monitoring Setup interface (page 25). It can mainly activate the monitoring transmission and selects the data to be transmitted.
Notifier	The Notifier button calls the Notifier Setup interface (page 29). It mainly sets what notifications to send (high level & low power) and whom to send it.
Import Setup	The Import Setup button prompts the user to load a measurement setup from a file. The source file can be a configuration previously exported (.cfg) or measurement file (.menm).
Export Setup	The Export Setup button prompts the user to save the current measurement setup into a file (.cfg).

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3.4 SLM Input Setup

M SLM Input Setup			×
SLM Source Mez	zo+Mic 🗸		
Mezzo An	alyzer		Microphone
Model 4-Ch. And	alyzer	Manufacturer	Z-Tech
SN M170215	03- <mark>0</mark> 6	Model	ZT341-ZT547
Channel Channel	1 ~	Serial Number	211278-271833
Range Low	~ 参	Sensitivity	45,31mV/Pa
Peak Overload	108,9dB	Calib. Date	2023/01/27 17:02
Under Range	30,9dBA		Calibrate
Noise	20,9dBA		Load From Mezzo
			Sensor-Check
		[OK Cancel

SLM Input Setup interface

The left part of the SLM Input Setup interface is related to the Mezzo Analyzer (without the sensor) and the right part is related to the microphone.

SLM Input Setup Interface	
Control / Indicator	Description
SLM Source Mezzo+Mic 🗸	This control allows to enable/disable the SLM input.
Model 4-Ch. Analyzer	Model of the detected hardware.
SN M17021503-06	Serial Number of the detected hardware.
Channel Input 1	Selects the input channel to be measured if several channels are available on the detected hardware.
Range Low	Selects the Low or High input range to use during the measurement.
*	This button resets the Mezzo input without unplugging it. Can be useful to retake control of a corrupted inputs that shows an abnormal behaviour.
Peak Overload 108,9dB Under Range 30,9dBA Noise 20,9dBA	The indicators show the operating amplitude range. Those values change according to the sensitivity and the selected gain.
Manufacturer Z-Tech Model ZT341-ZT547 Serial Number 211278-271833	The Manufacturer, Model and Serial Number of the microphone.
Sensitivity 45,31mV/Pa Calib. Date 2023/01/27 17:02 Calibrate	Sets the Sensitivity of the microphone. To set the sensitivity, a level calibration is usually done using the Microphone Calibration interface. It can also be set by manually overwriting the Sensitivity field.
Load From Mezzo	Loads the microphone information from the Mezzo memory (factory defined).



Sensor-Check

Opens the Sensor-Check Setup Interface. It is an advanced feature that allows to keep track of the level variation over time while using a reference output signal.

Microphone Calibration

The microphone can be calibrated using the Microphone Calibration interface and a sound pressure calibrator.



Microphone Calibration interface

- 1) Adjust the Calibrator Level and Calibrator Frequency according the sound calibrator used. Most calibrators generate 94 dB at 1 kHz.
- 2) Install the sound calibrator on the microphone and start the calibration signal.
- 3) Press Run to start the calibration measurement.
- 4) Wait a few seconds until the measured level stabilizes. 10 seconds should be enough.
- 5) Press Stop. The sensitivity is updated according to the calibration measurement.
- 6) If the new Sensitivity value is acceptable, press OK

Also, the Check button allows to run a calibration measurement using the current sensitivity but without automatically updating it.

3.5 OPL Input Setup

M OPL Input Setup		×
OPL Source Mezzo+Mic ~		
Mezzo Analyzer	Microphone	Bandwidth
Model 4-Ch. Analyzer	Manufacturer Z-Tech	Mode
SN M17021503-06	Model ZT341-ZT547	ISEE 2-250Hz using ZT-341
Channel Channel 2	Serial Number 211278-271833	Randwidth Eiltor
Range Low 🗸 参	Sensitivity 3,480mV/Pa	
Peak Overload 131,1dB	Calib. Date 2023/01/27 17:20	0,2Hz 315Hz
Under Range 46,1dB	Calibrate	Step Filter
Noise 31,1dB	Load From Mezzo	Fc 6Hz
		Slope 1
		Gain 2,3dB
		OK Cancel

OPL Input Setup interface

The left part of the OPL Input Setup interface is related to the Mezzo Analyzer (without the sensor), the center part is related to the microphone and the right part defines the bandwidth filters.

OPL Input Setup Interface	
Control / Indicator	Description
OPL Source Mezzo+Mic	This control allows to enable/disable the OPL input.
Model 4-Ch. Analyzer	Model of the detected hardware.
SN M17021503-06	Serial Number of the detected hardware.
Channel Channel 2	Selects the input channel to be measured if several channels are available on the detected hardware.
Range Low	Selects the Low or High input range to use during the measurement.
*	This button resets the Mezzo input without unplugging it. Can be useful to retake control of a corrupted inputs that shows an abnormal behaviour.
Peak Overload 131,1dB Under Range 46,1dB Noise 31,1dB	The indicators show the operating amplitude range. Those values change according to the sensitivity and the selected gain.
Manufacturer Z-Tech Model ZT341-ZT547 Serial Number 211278-271833	The Manufacturer, Model and Serial Number of the microphone.
Sensitivity 3,480mV/Pa Calib. Date 2023/01/27 17:20 Calibrate	It is recommended to use the specified sensitivity as defined during laboratory calibration tests. It is also possible to use a sound calibrator and the calibration interface to check the microphone sensitivity.

Load From Mezzo	Loads the microphone information from the Mezzo memory (factory defined).
Bandwidth	
Mode	
ISEE 2-250Hz using ZT-341	The Bandwidth parameters set the signal conditioning apply on the OPL signal.
Bandwidth Filter Low High 0,2Hz 315Hz	The Mode drop-down menu contains a few presets. In most cases, the preset "ISEE -2-250Hz using ZT-341" should be used in order to fulfill the ISEE requirements using the usual ZT-341 OPL microphone as determined during laboratory calibration tests.
Step Filter	Otherwise, the bandwidth filter defined the low cut-off frequency (second order high-pass) and the high cut-off frequency (second order low-pass). A step
Fc 6Hz Slope 1 Gain 2,3dB	filter is also used to slightly compensate the microphone attenuation below 10 Hz.

3.6 Vibration Input Setup

The Vibration Input Setup interface allows the user to select the needed Vibration Source: OFF, Mezzo+Accelerometer, Mezzo+Geophone, smartVib or smartGeo.

3.6.1 Vib Mezzo+Accelerometer

Wibration Input Setu	р					×
Vibration Sour	rce Mezzo+Accelerc	ometer 🗸	Display Unit	Acc g	~	
	Mezzo Analyzer				Band	width
Model	4-Ch. Analyzer				Mode	
SN	M19100809-01				ISEE	~
	Sensor					
Manufacturer	PCB Piezo	Peak Overload	1,28g Pk		Bandwi	dth Filter
Model	356A17	Noise	5,88E-5g RMS		Low	High
	Range Low ~	Lin Limit	0,000186g RM	S	1,6Hz	315Hz
	Input 2 - X Axis	Input 3 - Y Axis	Input 4 - Z A	xis	n=2	n=2
Serial Number	273221 Trans.	273221 Long.	273221 Vert.		Step	o Filter
Sensitivity	479,00mV/(g)	555,00mV/(g)	487,00mV/(g)		Fc N	aNHz
Calib. Date	1903/12/31 19:00	1903/12/31 19:00	1903/12/31 19	9:00	Slope	VaN
3	Calibrate	Calibrate	Calibrate		Gain	aNdB
					ОК	Cancel

Vibration Input Setup Interface - Mezzo+Accelerometer Mode

Vibration Input Setup Interface – Mezzo+Accelerometer Mode

Control / Indicator	Description
Mezzo Analyzer Model 4-Ch. Analyzer SN M19100809-01	 Model and serial number of the detected Mezzo hardware. The Mezzo Vibration Source is only available with a Mezzo 4ch Analyzer unit. When enabled, the allocation of the channels is forced to: Channel 1: SLM/OPL input Channel 2: vibration input, X axis (transversal) Channel 3: vibration input, Y axis (longitudinal) Channel 4: vibration input, Z axis (vertical)
Manufacturer PCB Piezo Model 456A17	The manufacturer and model of the accelerometer information that can be entered manually for further reference.
Range Low 🗸	Selects the Low or High input range to be used during the measurement.
Peak Overload 1,28g Pk Noise 5,88E-5g RMS Lin Limit 0,000186g RMS	The indicators show the operating amplitude range. Those values change according to the sensitivity and the selected gain.
Input 2 - X Axis Serial Number 273221 Trans. Sensitivity 479,00mV/(g) Calib. Date 1903/12/31 19:00 Calibrate	The serial number and sensitivity of the accelerometer can be set manually. It is recommended to use the specified sensitivity as defined during laboratory calibration tests. Sometimes, it is also possible to evaluate the sensitivity using a reference shaker and the Sensor Calibration interface.
Bandwidth Mode ISEE Bandwidth Filter Cov High 1,6Hz 315Hz n=2 n=2 Step Filter Fc NaNHz Slope NaN Gain NaNdB	With the Limit Bandwidth disabled the vibration bandwidth stops at 500 Hz. Optionally, a bandpass filter can be applied to limit the bandwidth of the 3 vibration inputs. It is useful to eliminate from the global data the undesirable energy in the lower and higher frequencies. The Mode drop-down menu contains a few presets: ASHRAE, ISEE, DIN. Otherwise, the bandwidth filter defined the low cut-off frequency (n order high- pass) and the high cut-off frequency (n order low-pass). Although rarely useful, an advanced step filter is also available.

Vibration Calibration – Mezzo Mode

The microphone can be calibrated using the Vibration Calibration interface and a vibration calibrator pressure calibrator.



Vibration Calibration interface

- Adjust the Calibrator Level and Calibrator Frequency according the calibrator used. The shaker PCB 394C06 used in this example generates an acceleration of 1.00 g rms (9.81 m/s² rms) at 159.2 Hz.
- 2) Fix the accelerometer on the calibrator and start the calibration signal.
- 3) Press Run to start the calibration measurement.
- 4) Wait a few seconds until the measured level stabilizes. 10 seconds should be enough.
- 5) Press Stop. The sensitivity is updated according to the calibration measurement.
- 6) If the new Sensitivity value is acceptable, press OK

Also, the Check button allows to run a calibration measurement using the current sensitivity but without automatically updating it.

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3.6.2 Vib Mezzo+Geophone

M Vibration Input Setu	р				×
Vibration Sour	rce Mezzo+Geopho	ne 🔽	Display Unit Vel m	ım/s ~	
	Mezzo Analyzer			Band	width
Model	4-Ch. Analyzer			Mode	
SN	M19100809-01			ISEE	\sim
	Sensor			Sensor	
Manufacturor	Soft dP	Peak Overland	24.2mm/c Dk	Direct	~
wanulacturer		Peak Overload	24,311111/5 FK	Bandwid	dth Filter
Model	AG02 4.5Hz	Noise	0,00103mm/s RMS	Low	High
	Range Low 🗸	Lin Limit	0,00325mm/s RMS	1,6Hz	315Hz
	Input 2 - X Axis	Input 3 - Y Axis	Input 4 - Z Axis	n=2	n=2
Serial Number	AG0222082301-X	AG0222082301-Y	AG0222082301-Z	Step	Filter
Sensitivity	28,06mV/(mm/s)	29,10mV/(mm/s)	27,43mV/(mm/s)	Fc Na	NHz
Calib. Date	1903/12/31 19:00	1903/12/31 19:00	1903/12/31 19:00	Slope	laN
	Calibrate	Calibrate	Calibrate	Gain Na	NdB
IEPE/ICP supply of some Mezzo inputs are OFF OK Cancel					

Vibration Input Setup Interface – Mezzo+Geophone Mode

As stated in the red notice at the bottom of the interface, the IEPE conditioning on all inputs is power off when the Mezzo+Geophone mode is activated. This means that common SLM and OPL measurements are not possible.

Vibration Input Setup Interface – Mezzo+Geophone Mode

Control / Indicator	Description
Mezzo Analyzer Model 4-Ch. Analyzer SN M19100809-01	 Model and serial number of the detected Mezzo hardware. The Mezzo Vibration Source is only available with a Mezzo 4ch Analyzer unit. When enabled, the allocation of the channels is forced to: Channel 1: SLM/OPL input Channel 2: vibration input, X axis (transversal) Channel 3: vibration input, Y axis (longitudinal) Channel 4: vibration input, Z axis (vertical)
Manufacturer Soft dB Model AG02 4.5Hz	 The manufacturer and model of the accelerometer information that can be entered manually for further reference. The 2 common model available are: AG01 targeted for DIN measurements (1-80Hz) AG02 targeted for ISEE measurements (2-250Hz)
Range Low	Selects the Low or High input range to be used during the measurement.
Peak Overload 24,3mm/s Pk Noise 0,00103mm/s RMS Lin Limit 0,00325mm/s RMS	The indicators show the operating amplitude range. Those values change according to the sensitivity and the selected gain.

_

Input 2 - X Axis Serial Number AG0222082301-X Sensitivity 28,06mV/(mm/s) Calib. Date 1903/12/31 19:00 Calibrate	The serial number and sensitivity of the geophone can be set manually. It is strongly recommended to use the specified sensitivity as defined during laboratory calibration tests.
Bandwidth Mode ISEE Sensor Geophone 4.5Hz Bandwidth Filter Multiple 0,2Hz 315Hz n=1 n=2 Step Filter Fc 1,05 Gain 31,3dB	With the Limit Bandwidth disabled the vibration bandwidth stops at 500 Hz. Optionally, a bandpass filter can be applied to limit the bandwidth of the 3 vibration inputs. It is useful to eliminate from the global data the undesirable energy in the lower and higher frequencies. A few presets are available using a combination of the Mode and the Sensor drop-down menus. Mainly, ISEE with Geophone 4.5Hz (AG02) and DIN with Geophone 10Hz (AG01) can be selected. Otherwise, the bandwidth filter defined the low cut-off frequency (n order high- pass) and the high cut-off frequency (n order low-pass). On step filter is also used to slightly compensate the geophone attenuation in lower frequency range.

3.6.3 Vib smartVib

Vibration Input S	Setup				Х
Vibration So	ource smartVib		✓ Display	Unit Acc g	Vel mm/s v
Mode	smartVib v5, firmware v3 VS0120061801 Range Low	×	Acceleration C Acceleratio Velocit	overload 1g Pk n Noise 0,000867 ty Noise 0,1mm/s	7g RMS
Sensitivity Bandwidth	Y Axis 400,76mV/(g)	Y Axis 404,75mV/(g)	Z Axis 408,27mV/(g) 315Hz 1,6Hz	Calib. Date 2020/06/23 Velocit	Calibrate
[Sensor-Check			View Certificate	
					OK Cancel

Vibration Input Setup Interface - smartVib Mode

Vibration Input Setup Interface - smartVib Mode

Control / Indicator	Description
Model smartVib v5, firmware v3 SN VS0120061801	Model and serial number of the detected smartVib Smart Vibration Sensor.
Range Low 🗸	Selects the Low or High input range to be used during the measurement.



Acceleration Overload 1g Pk	
Acceleration Noise 0,000867g RMS	The indicators show the operating amplitude range. Those values change according to the sensitivity and the selected gain
Velocity Noise 0,1mm/s RMS	according to the scholavity and the scienced gain.
X AxisSensitivity400,76mV/(g)Calib. Date2020/06/23Calibrate	The current sensitivity of the 3-vibration axis of the smartVib sensor are displayed. Notice that each of the range Low and High has its own sensitivity and is stored on the sensor Flash memory. It is strongly recommended to use factory sensitivity as defined during laboratory calibration tests. However, the calibration interface could be useful to ensure that the sensor lies flat in the ground or on a surface.
Acceleration 315Hz Velocity 315Hz	The frequency bandwidth is set separately for acceleration and velocity. The low cutoff frequency can be adjusted from 0.5 to 5 Hz. The high cutoff frequency can be adjusted from 100 to 1000 Hz. Be aware that all the recorded vibration data are affected by this filter. Therefore, the filter cannot be removed in post analysis.
Sensor-Check Ores Schold Morphone X Mode: Torey Day Morphone X Mode: Sensor-Check Saraf Another V0322095401 X Mode: Sensor-Check Saraf Another V0322095401 X Mode: Sensor-Check Saraf Another V0322095401 X Mathematic Sensor-Check Saraf Another V0322095401 X	The Sensor-Check button opens the Sensor-Check Setup from where the periodic check can be set and view. The sensor-check can also be launched manually. During a sensor-check, the smartVib sensor injects a signal into its inputs and the measured levels are compared to a target established in factory. The sensor is approved if the deviation from the target is within the specified tolerance.
View Certificate	The View Certificate button opens an interface that displays the last calibration certificate including the test results.

3.6.4 Vib smartGeo

۵	Vibration Input Se	etup									×
	Vibration So	urce smartGeo			⊻ D	isplay U	Init Ve	l mm/s	~		
	Model	smartGoo ISEE (2 25017		Overlaad	120mr	n/c Pk				
	WOUEI	SinartGeo ISEE (A	2-25002)		Overload	120111	II/S PK		_		
	SN	GS0122103101			Noise	0,015n	nm/s RN	٨S			
					Bandwidth	2Hz to	250Hz				
		X Axis	Y Axis		Z Axis		Calib. Da	ate			
	Sensitivity	19,34mV/(mm/s)	19,67mV/(r	mm/s)	18,84mV/(r	mm/s)	2022/11	1/11			
		Sensor-Check					View	w Certificate	e		
									ОК	Cancel	

Vibration Input Setup Interface - smartGeo Mode

Vibration Input Setup Interface – smartGeo Mode



Control / Indicator	Description
Model smartGeo ISEE (2-250Hz) SN GS0122103101	Model and serial number of the detected smartVib Smart Geophone Sensor.
Overload 120mm/s Pk Noise 0,015mm/s RMS Bandwidth 2Hz to 250Hz	The indicators show the operating amplitude range and bandwidth.
X Axis Y Axis Sensitivity 19,34mV/(mm/s) 19,67mV/(Calib. Date 2022/11/11	The factory sensitivity of the 3 axes of the smartGeo sensor are displayed. The values are stored in the Flash memory of the sensor itself and it can only be changed during the calibration process in the Soft dB laboratory.
Sensor-Check Construction of the sense of t	The Sensor-Check button opens the Sensor-Check Setup from where the periodic check can be set and view. The sensor-check can also be launched manually. During a sensor-check, the smartGeo sensor injects a signal into its inputs and the measured levels are compared to a target establish in factory. The sensor is approved if the deviation from the target is within the specified tolerance.
View Certificate	The View Certificate button opens an interface that displays the last calibration certificate including the test results.

– Soft d B

3.7 Interval Data Setup

The interface can set up to four intervals, each having its own duration and set of data to record. The data of a disabled input (SLM/OPL/Vib Input Setup interfaces) appear greyed out in the current interface. The greyed out data will not be recorded no matter its state.

At the bottom of the interface, a file size estimation helps understanding the impact of the data setup.

M Interval Data Setup		×
Intervals	SLM Vib&OPL Other Data	
Active? Type Duration Align 1 Periodic V 00:00:05 2 Periodic V 00:00:30 3 Periodic V 01:00:00 4 DEN 1 V	SLM VID&OPL Other Data SLM Mode must be activated in the SLM Input Setup. SPL Fast Min/Max Stats Leq Peak Taktmax Gbl 1/3 Gbl 1/3 Gbl 1/3 FFT Gbl 1/3 LTm5 Gbl 1/3 Gbl 1/3 Gbl 1/3 FFT Gbl 1/3 LTm5 FFT Bandwidth 20kHz FFT Resolution 20,002 Hz FFT Resolution 20,002 Hz	
	L99% v	
Current event setup: 343 MB/hour (1	L95% L99% v	
Case no event: 8,46 MB/hour (561,8days) OK Cance	el

Interval Data Setup interface

Intervals Setup

Control / Indicator	Description
	An interval determines the period during which are compiled the statistics on the data input.
Active? Type Duration Align	Up to four independent intervals can be enabled.
1 📝 Periodic 💟 00:00:05 🔇 2 📝 Periodic 💟 00:00:30	Select Periodic type for a fixed interval from 1 second to 24 hours. If the Align button is activated, the periods will be aligned with the clock and with the starting time otherwise.
3 🔽 Periodic 🔽 00:01:00 🚱	The type also allows a few options for typical parts of a day:
4 🗸 DEN 1 🗸	 DN (Day/Night) for 7h to 19h and 19h to 7h
	 DEN1 (Day/Evening/Night) for 7h to 19h, 19h to 22h and 22h to 7h
	DEN2 (Day/Evening/Night) for 7h to 19h, 19h to 23h and 23h to 7h

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SLM	Vib&OPL	Other Da	ita
SLM M SPI	lode must be	e activated in	the SLM Input Setup. Infrasound (<16Hz)
Min/I	Max St	ats	LeqPeakTaktmax
Gbl	1/3 Gbl	1/3 Gbl	1/3 FFT Gbl 1/3 LTm5
	LN% L5% L10% L50% L90% L95% L99%		FFT Bandwidth 20kHz FFT Resolution 20,002 Hz

SLM Data tab

SLM Data Setup	
Control / Indicator	Description
SPL Fast Min/Max Stats Gbl 1/3 Gbl	The upper control sets the SPL detector speed: Slow, Fast or Impulse. The checkboxes under Min/Max allows selecting Min and Max values for recording. Global values (A, C and Z) are always recorded but 1/3 Octave can be unchecked. The checkboxes under Stats allows selecting Statistic (Percentiles) values for recording. Global values (A, C and Z) are always recorded but 1/3 Octave can be unchecked. The LN% list allows adding or removing percentile levels from 0.01% to 99.99%. The percentiles needed in post analysis must be selected here before measuring.
Leq Gbl 1/3 FFT FFT Bandwidth 20kHz V FFT Resolution 20,002 Hz	Global Leq values (A, C and Z) are always recorded, 1/3 Octave and FFT can be unchecked. The Leq FFT spectrum bandwidth is user defined: 20k, 10k, 5k, 3.33k, 2k or 1kHz. It corresponds to the frequency resolution: 20, 10, 5, 3.33, 2, and 1Hz.
Peak Gbl 1/3	Global Peak values (A, C and Z) are always recorded, 1/3 Octave can be unchecked.
Taktmax LTm5	Allows selecting for record the Taktmaximal LTm5. Standard use would be LAFTm5, with A frequency weighting, Fast time weighting and a period higher than 5 seconds. By definition, The Taktmaximal is the average of the maximum LAF at 5-second intervals.
Infrasound (<16Hz)	The Infrasound control decides whether are not to include the energy below 16 Hz in the evaluation the global levels. It is mainly significant when no frequency weighting is applied (dBZ).



SLM Vib	&OPL	Other Da	ata										
Acceleratio	n				Velo	city							OPL
Peak Max	RMS A	vg			Peak	Max				RMS	Avg		Peak Max
Gbl 1/3	Gbl 1	1/3 FFT	Wm	Comb.	Gbl	1/3	VBx	KBF	KBFTm	Gbl	1/3	FFT	Gbl
Image:	✓ [\checkmark	\checkmark	\checkmark			\checkmark	\checkmark	\checkmark			 Image: A second s
✓ ☑	✓ [✓ ✓	\checkmark	\checkmark	✓	\checkmark	\checkmark	\checkmark	\checkmark	✓	\checkmark	\checkmark	 Image: A second s
✓ 🗹	✓ [< </td <td>~</td> <td>\checkmark</td> <td>✓</td> <td>\checkmark</td> <td>\checkmark</td> <td>~</td> <td>\checkmark</td> <td>✓</td> <td></td> <td>\checkmark</td> <td> Image: A second s</td>	~	\checkmark	✓	\checkmark	\checkmark	~	\checkmark	✓		\checkmark	 Image: A second s
✓ 🗹	✓ [< </td <td>~</td> <td>\checkmark</td> <td>✓</td> <td>\checkmark</td> <td>\checkmark</td> <td>\checkmark</td> <td>\checkmark</td> <td>~</td> <td></td> <td>\checkmark</td> <td> Image: A second s</td>	~	\checkmark	✓	\checkmark	\checkmark	\checkmark	\checkmark	~		\checkmark	 Image: A second s

Vibration Data tab

Vibration Data Setup

Control / Indicator	Description
Acceleration Peak Max Gbl 1/3 Gbl 1/3 FFT Wm Comb.	Maximum acceleration peak for the global level (always recorded) and for each band of the 1/3 octave spectrum.
Acceleration Peak Max Gbl 1/3 Gbl 1/3 FFT Wm Comb.	Average acceleration RMS (root mean square) for the global level (always recorded), 1/3 octave spectrum (0.5 to 500Hz), FFT spectrum (0 to 500Hz, 1Hz resolution), global Wm ¹ and global Combined ² .
Velocity Peak Max Gbl 1/3 VBx KBF KBFTm Gbl 1/3 FFT V X X X X X X X X X X X X X X X X X X X	Maximum velocity peak for the global level (always recorded) and for each band of the 1/3 octave spectrum, global VBx (VB1, VB2 & VB3) ³ , global KB _{Fmax} ⁴ , global KB _{FTm} ⁵ . KBFmax and KBFTm are used in the DIN4150-2 standard (Human exposure to vibration in Buildings)
Velocity Peak Max Gbl 1/3 VBx KBF KBFTm Gbl 1/3 FFT V V V V V V V V V V V V V V V V V V V	Average velocity RMS (root mean square) for the global level (always recorded), 1/3 octave spectrum, FFT spectrum.
OPL Peak Max Gbl	The maximum Peak overpressure level during the interval. Its aim is to measure the aerial blow caused by a blasting event. It is usually measured along with the vibration data.

¹ Wm data: Defined in ISO 2631-2 (whole-body vibration in buildings). Global rms acceleration with the Wm frequency weighting (in all directions). The frequency span is 1 to 80 Hz.

² Combined data: Defined in ANSI S2.71 (human exposure to vibration in buildings). This frequency weighted global level is used for preliminary investigation of the human exposure to vibration. The frequency span is 1 to 80Hz

³ VBx: Defined in DIN 4150-3 (effects of short-term vibration on structure). These 3 frequency weighted global levels are simple vibration guidelines at the foundation of a particular type of structure. The frequency span is 1 to 100Hz.

VB1: Buildings used for commercial purposes, industrial buildings, and buildings of similar design. Criteria 20 mm/s.

VB2: Dwellings and buildings of similar design and/or occupancy. Criteria 5 mm/s.

VB3: Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings under preservation order). Criteria 3 mm/s.

 4 KB_{Fmax}: The maximum weighted vibration severity is defined in DIN 4150-2 (human exposure to vibration in buildings). It is the maximum of the KB_F values during the evaluation period, where KB_F is the instantaneous time-averaged acceleration level with a frequency weighting and with a Fast time weighting (125 ms exponential time constant). Can be used as an absolute criterion that should not be exceeded. The frequency span is 1 to 80 Hz.

⁵ KB_{FTm}: Defined in DIN 4150-2 (human exposure to vibration in buildings). Average of the values of KB_{Fmax(i)}, where each KB_{Fmax(i)} has been measured during 30s. Can be used as criteria for the dose not to exceed for a long period of time. The frequency span is 1 to 80 Hz.



SLM Vib&OPL	Other Data				
Weather	Traffic	Dust	Power	Gas	
		PMtot 🗸			

Other Data tab

Other Data Setup	
Control / Indicator	Description
Weather	Allows selecting for record the weather data. Recorded values are: barometer, temperature, humidity, wind speed and direction, each with minimum, maximum and average values.
Traffic	Allows selecting for record the traffic data. Recorded values are: vehicles count, mean speed, maximum speed and minimum speed for all classes of vehicles.
Dust PMtot	 Allows selecting for record the dust monitor data. Recorded values are: dust concentration, flow rate within the sensor, temperature, humidity and barometer, each with minimum, maximum and average values. The scroll down menu button should be set to match the actual dust filter that is being used on the dust meter. Here are the possibilities: PMtot (no filter) PM1 (1 µm) PM2.5 (2.5 µm) PM4 (4 µm) PM10 (10 µm)
Power	 Allows selecting for record the power data. Recorded values are: Solar panel: voltage, current, power. Battery: voltage, current, power, level, temperature. Load: voltage, current, power. In average mode, the average, maximal and minimal values are available. Minimum, maximum and average data are recorded.
Gas	Allows selecting for record the gas monitor data. Recorded values are the concentration of up to 8 different pollutant gases: CO, NO ₂ , O ₃ , CH ₄ , NO _X , C ₆ H ₆ , H ₂ S and SO ₂ .

– Soft dB

3.8 Event Data Setup

M Event	t Data Setup				×
Event	Mode	Event Source	Audio	Pics Average	Vib Wave
1	Periodic 🗠	10s event repeating every 5m00s, clock alligned			
2 🔽	Trigger	30s event upon 70dBA SPL exceedance, 2s pre-trig			
3	Periodic 🗸	10s event repeating every 5m00s, clock alligned			
4	Periodic 🕓	10s event repeating every 5m00s, clock alligned			
		Audio Pictures Format MP3 Low Quality Image: Complex state of the state of th	x		
Currer	nt event setup: Case no event:	19,8 MB/hour (127,4days) 5,09 MB/hour (495,9days)		OK Can	cel

Event Data Setup Interface

Event Data Setup Controls

Control / Indicator	Description
Event	The Event checkboxes enable up to 4 different sets of events. The events are independent and can be concurrent, so that same audio can be found on event type 1 and event type 2.
Mode Periodic	The Mode menu selects when an event type recorded. The Periodic mode starts at the defined interval for a defined duration. The Trigger mode starts when a selected data reaches the specified trigger level and stops after a defined duration.
Event Source 10s event repeating every 5m00s, clock alligned	The Event Sources give the information on the event setup. Click on this control to edit.
30s event upon 70dBA SPL exceedance, 2s pre-trig	In Periodic mode, the event duration and the interval between events can be set. If the Align button is enabled, the event will be aligned with the clock and with the measurement start time otherwise.
OK Cancel	In Trigger mode, the event duration, pre-trig duration, the trig data source (either SLM, OPL or Vib) and trig level can be set.
Imagenet funct X Duration Prefitig Data Level Mode Limit Occurrence to 00:00:30 2s Sound ¥ 70.068 Simple Trig 0 0000000	A trig mode can be set in Simple Trig (always the specified duration) or in Latch Trig (duration resets every time it trigs).
SPL dBA 🛛	It is also possible to limit the occurrence to a specific time. It avoids having too much exceedance recordings, when it's raining for instance. Enabling this feature, two events will be separated by the limit time unless the level is higher than the previous event.



⁶ When trigger events are enabled, it is often impossible to determine the exact size of the recordings. Therefore, the worst case scenario is used to estimate the size information for the used event setup.

– Soft dB

3.9 Record Setup

M Record Setup	×
Record Directory	
C:\Users\Proprietaire\D	ocuments\Mezzo 🗁
FileFormat	File Increment
YYYYMMDD_hhmmss	✓ Every Hour ✓
	OK Cancel

Record Setup interface

Record Setup interface	
Control or Indicator	Description
Record Directory	This field allows selecting the record directory. The default directory is <i>User Documents</i> \Mezzo\ENM.
FileFormat YYYYMMDD_hhmmss 🔹	This list box allows selecting the file name format. Choices are: • YYYYMMDD_hhmmss • MMDD_hhmmss • DD_hhmmss
File Increment Every Hour	 This list box allows selecting the automatic file increment behaviour. Choices are: On Start Only (No auto file increment) Every Hour (recommended) Every Day Every Week
	No matter how the File Increment is set, a file reaching the size of 1 gigabyte (1 GB) will also be incremented. Afterwards, several files with a similar setup can be opened all at once.

3.10 Web Monitoring Setup

Once a Mezzo station has been registered for monitoring, the measurement data can be sent to the Soft dB monitoring server and the data can be displayed on the monitoring web portal (https://monitoring.softdb.com/). Contact Soft dB for more information.



Web Monitoring Setup Interface

Web Monitoring Setup Interface

Control or Indicator	Description
Enabled M19100809-01 registered to Station "StationTest Station not linked to a Site	This checkbox enables the data transfer to the monitoring server. If the station is properly activated on the server side, the Mezzo serial number will show as registered to a station and any link to a monitoring site will also be displayed.
 Period 1 Event 1 Period 2 Event 2 Period 3 Event 3 Period 4 Event 4 	Theses checkboxes set which of the available data will be transmitted. One could decide to only send the first period and the audio file even while all the data are being recorded on the unit hard drive. A control with a greyed label means that the data is not currently available for the current setup.
Transfer Info Current event setup: 339 MB/hour Case no event: 5,03 MB/hour	The Transfer Info gives an estimation of the data transfer rate to the monitoring server using the current setup.

– Soft dB

3.11 Notifier Setup

м	Notifier Setup																×
	Monitoring Station Name																
	Construction Site North																
	Additionnal Text																
	Next to truck entrance																
	Notifier List																
	Recipient	Power	Check	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	^	
	mail to : recipient_1@hotmail.com				Х												
	mail to : monitor.admin@softdb.com	Х	Х	Х	Х												
															<u> </u>		
															<u> </u>		
																~	
	Send a test message	Power	Sensor Check	Ex	Leve) el ance		[Viev	v Log	I					
												ОК		C	ancel		

Notifier Setup Interface

Notifier Setup Interface Controls

Control / Indicator	Description
Monitoring Station Name Construction Site North	This text field allows entering a name for the monitoring station. This name will be displayed in the notification message.
Additionnal Text Next to truck entrance	This text field allows entering additional information of any kind related to the monitoring station. This text will be displayed in the notification message.
Notifier List Power Check L1 L2 L3 mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1@hotmail.com X X X I mail to : recipient, 1 X X X I mail to : recipient, 1 X X X X mail to : recipient, 1 X X X X	 The Notifier List sets the recipients who will receive notifications. Click the button to add a recipient, click the button to edit a recipient and click the button to delete it. A recipient can be either an email address or a phone number (if email to text service is offer by the phone provider). Each notification can be enabled independently for each recipient. The notification types are: Power Notifier: click Power button to configure. Sensor Check Notifier: click button to configure. Level exceedance: click button to configure up to 12 level exceedance criteria.
Send a test message	This button sends a test message to all recipients.
E View Log	This button gives access to the notification log file, which logs every message sent by the Noise Monitor module.

– Soft d B

3.12 Power Notifier Setup

M Power Notifier Setup				×
	Enable	Low	OK	
Internal Battery		< 30%	> 80%	
External Battery		< 20%	> 80%	
PC Unplugged/Plugged-In				
			ОК	Cancel

Power Notifier Setup

The Power Notifier Setup allows configuring the conditions for sending notifications on event related to the power supply.

Power Notifier Setup Interface Controls

Control / Indicator	Description
Internal Battery 🔽 < 30% > 80%	On a laptop or a tablet, a notification can be sent when the battery level goes below the specified Low level or over the specified OK level.
External Battery 🖌 < 20% > 80%	When using the EpSolar charger, a notification can be sent when the battery level goes below the specified Low level or over the specified OK level.
	If the PC is not power externally anymore (starts powering from internal battery), a "PC unplugged" notification is sent.
	If the external power of the PC comes back, a "PC Plugged-In" notification is also sent.

– Soft d B

3.13 Noise Exceedance Setup

M	Level Exceedance Se	etup								×
	Su Mo Tu We Th Fr Sa		- Interval		Data		Global /	Band	Level	
1			#4		SLM	~	Band Emer	gence	~	
0	07:00	19:00	DEN1	·	Leq	~	1kHz 🗸	Emerge	-> 5,00d	B
2			#2		OPL	~	Globa	1	100,0 d	B 🗸
0	00:00	00:00	30s `	· _	Lpk	~				
3			#2		Vib Vect. Sum	~	Globa	1	v 0,1g	
0	00:00	00:00	30s `	1	Acc. Peak Max	~				
4			#3		Dust	~	Globa	1	1mg/r	n³
0	00:00	00:00	1h `	í 🗌	Average	~				
5			#3		Gas - CO	~	Globa	l I	1mg/r	n³
	00:00	00:00	1h `	· _	Average	~				
	Limit Message	e Occurence t	o 00:00:0)1					OK Can	cel
-							0.1	~ ·		

Noise Exceedance Setup

Leaving all the flexibility to the user, the Noise Exceedance Setup offers up to 12 independent noise notifications that can be set on SLM, OPL or vibration data. Any control or menu selection that is greyed out means that the data is not available.

Control / Indicator	Description
Su Mo Tu We Th Fr Sa	These checkboxes set the day of the week (Sunday to Saturday) that the notification is acive.
Start/End Time 07:00 19:00	These time controls set the start and end time that the notification is active. To enable a notification all day long, set both Start Time and End Time to 00:00:00.
Period #2 30sec	This control selects the average period used to test the exceedance. The period selection matches the intervals set in the Data Setup interface. At each period end, a notification is registered if the exceedance is detected.
	Here is the list of SLM data that are available to test the exceedance: • Leq
SLM Data	• Lpk
SLM 🗸	• LTm5 (Taktmaximal)
Leq	• Lmin
	• Lmax
	LN% (statistics)

Noise Exceedance Setup Interface Controls

_Soft d	B
OPL Data	The only OPL data available is the OPL peak max.
Vibration Data Data Vib Vect. Sum ~ Acc. Peak Max ~	 Here is the list of Vibration global data that are available to test the exceedance: Axis X, Y, Z or Vector Sum Acceleration: Peak, RMS, Wm, Comb Vibration: Peak, RMS, VB1, VB2, VB3, KB_{Fmax}, KB_{FTm}
Dust Data Dust Average	The only Dust data available are the Dust average, min or max.
Gas Data Gas - CO V Average V	The Gas criteria can be the average, min or max concentration of one of the gas sensors (CO, NO ₂ , O ₃ , CH ₄ , NO _x , C ₆ H ₆ , H ₂ S and SO ₂).
Global / Band Global v Global	 While global value criteria are simple and most common, more advanced frequency criteria are also available for some SLM and Vibration data: global value 1/2 actave band, absolute value
Band Emergence Band Abs&Emerg Spectrum Curve	 1/3 octave band, emergence from previous and next bands 1/3 octave band, combines both absolute and emergence 1/3 octave spectrum curve describing the frequency pattern criteria
Limit Message Occurence to 01:00:00	This control limits the occurrence that notifications are sent to recipients. Limiting to 00:00:00, a message will be sent as soon as a notification is registered. Limiting to 01:00:00 (1 hour), no more than one message per hour will be sent. While sending a message is blocked, new notifications will continue to accumulate and will be sent in a single message as soon as the limit time is done.
	These buttons add or delete an exceedance notification (up to 12).



3.14 Viewer Menu



Viewer Menu tab

The current data of the several optional devices can be accessed from the Viewer Menu tab.

Viewer Menu

lcon	Description
Check Power	The Check Power button calls the Power Viewer interface (page). It gives the power information about the PC. Given that an EpSolar Tracer solar charger is found, it also gives the power information about the solar panel, battery and load.
Check Weather	The Check Weather button calls the Weather Viewer interface (page 34). Given that a supported weather meter is found, it displays the current weather data.
Check Camera	The Check Camera button calls the Camera Preview interface (page 35). Whether in acquisition on not, the interface shows the image produced by the camera. The camera setup is available in the Event Data setup (page 25)
Check Traffic	The Check Traffic button calls the Traffic Viewer interface (page 35). Given that a traffic radar is found, it displays the list of the last detected vehicles. A setup button also opens the Traffic Setup interface.
Check Position	The Check Position button calls the Position Viewer interface (page 36). Given that a supported GPS is found, it displays the current position if available.
Check Dust	The Check Dust button calls the Dust Viewer interface (page 36). Given that a supported dust monitor is found, it displays the current dust concentration.
Check Gas	The Check Gas button calls the Gas Viewer interface (page 36). Given that a supported dust monitor is found, it displays the current concentration of the available gas sensors.
Check smartVib	The Check smartVib button calls the smartVib Viewer interface (page 37).
Check smartGeo	The Check smartGeo button calls the smartGeo Viewer interface (page 37).
Check Sensor now!	The Check Sensor now button allows to manually launch the Sensor Check sequence during a measurement. The sensors (SLM mic, smartVib and/or smartGeo) that have their sensor check activated will then proceed to the check-up the same way it would with a scheduled periodic check.



3.14.1 Power Viewer



Power Viewer Interface

This interface allows viewing the current power state of the monitoring station computer as well as the optional charge controller. Click on the View Log button to access the power log file.

3.14.2 Weather Viewer

M Weather Viewer				
				&
Temperature	12.8	٩F	-	Detected
Humidity	49%			
Wind	8	mph	▼ ENE	😣 Set North
Rain	0	in/h	-	
Barometer	30.553	inHg	•	

Weather Viewer Interface

This interface allows viewing the current weather data of the weather meter if detected. If a Davis Instruments model is detected, the Set North button can be used to set to north the current wind direction.



3.14.3 Camera Viewer



Camera Viewer interface

This interface allows viewing the video produced by the camera. Snapshots of this video can be included in the events.

3.14.4 Traffic Viewer

							M Traffic Setup	×
							Detection Parameters Classification Th	reshold
M Traffic Viewer						×	Sensitivity 4 8 12 16 Away	Closing
		km /b				Not Detected	Cosine Angle 1 0° Class 1 84	84
Message List	Closing/Away	Speed	Ctrongth	Duration		Managa Tima	Cosine Angle 2 0° Class 2 68	68
Class	Closing/Away	Speed	Strength	Duration		00:00:00,000 DD/MM/YYYY	Target Strength Sensitivity 50 Class 3 53	53
						Nb Messages	Min Tracked Distance 200 ft Class 4 37	37
L						0	Low Speed Threshold 0 m/s	0
							High Speed Threshold 200 m/s	eset to Default
							Density Span	
							Target Acquisition 70% 200ms	
							Target Loss 0% 500ms	
							Reset to Default	
					~	Traffic Setup	ОК	Cancel

Traffic Viewer and Traffic Setup interfaces

This interface allows viewing the last readings of the optional traffic sensor. For better traffic measurements, care should be taken to properly install the radar as recommended by the manufacturer. Also, the Traffic Setup should be adjusted and tested for each measurement location.

3.14.5 Position Viewer

Connected to NMEA GPS					
Ready					
Latitude	46.792569	985			
Longitude	-71.2311217		Hor. Acc.	8.1	
Altitude	67.8		Vert. Acc.	1	
Satellites	Used 2	Detected 7			

Position Viewer interface

This interface allows viewing the current position if a GPS device is available.

3.14.6 Dust Viewer



This interface allows viewing the current dust data of the optional dust monitor.

3.14.7 Gas Viewer

M Gas Vi	ewer	×
General	Details	Detected
со	105,276	mg/m³ ~
NO2	0,52975	mg/m³ 🗸
O3	NaN	mg/m³ 🗸
CH4	NaN	mg/m³ 🗸
NOX	NaN	mg/m³ 🗸
C6H6	NaN	mg/m³ ~
H2S	NaN	mg/m³ ~
SO2	NaN	mg/m³ ~

Gas Viewer interface

This interface allows viewing the current gas data of the optional gas sensors.

3.14.8 smartVib Viewer



This interface allows viewing the live vibration data waveforms of the Soft dB smartVib sensor which provide the vibration acceleration and integrated velocity. The View Log button gives access to the connection and error log of the sensor.

3.14.9 smartGeo Viewer



This interface allows viewing the live vibration data waveform of the Soft dB smartGeo sensor which provide the vibration velocity. The View Log button gives access to the connection and error log of the sensor.



3.15 Control Pane



🕨 Run

Stop

Comment

Control Pane

Controls & Indicators	
Control / Indicator	Description
00:00:40	The duration of the measurement in format HH:MM:SS.
Run	The Run button starts the measurement.
Stop	The Stop button stops the measurement.
	The Comment button directly accesses the comment for viewing or editing. The comment is also available in the General tab of the File Info (File \rightarrow Info) and on the File tab.
StatusStatus	 The Status color indicates what the acquisition state is: Grey: acquisition off Green: acquisition running
Sat.Sat.	The Sat color indicates if any of the measured signal (SLM/OPL/Vib) is overloading during the acquisition. • Grey: no overload detected • Red: overload detected
o i a	The status of optional devices is displayed on the top of the main panel. If a device is not used in the software setup, its indicator is greyed out. A green check appears on properly connected devices and a red x appears on disconnected devices. Here are the indicators in order: smartVib smartGeo Camera Weather
Q	This position icon is green if a valid position fix is available and is grey otherwise. Also, the number within the icon indicates how many satellites is detected by the GPS.
2	This button opens the user guide in the default pdf reader.

Soft d B	
<u>.</u>	The caution symbol appears in the upper right corner in case something is going wrong in the system. This means that the PC is struggling to complete the tasks it has been requested by the software. This may be a symptom of bad connection to the internet (web monitoring). Worst, it may be due to a computer not powerful enough. Click on the icon to open the System Status interface.
	The globe symbol shows the state of the transfers to the server when the Web Monitoring is enabled. Click on the icon to open the System Status interface.
() () () () () () () () () () () () () (Greyed out: neither transfer nor monitoring in progress. Plain globe: monitoring in progress, transfers are idled. Green upward arrow: monitoring in progress, a transfer is in progress.
	Red exclamation mark: error on a transfer attempt.

Elapsed Time Elapsed Time 00:00:00 00:00:40 Status Status Sat. 🔵 Status 🧹 🔵 Sat 🚄 Sat Run Run Stop Stop Comment Comment MEZZO Precision Microph Soft dB

Control Pane correspondence on the Mezzo Precision Microphone.

As shown above, several controls and indicators found in the Control Pane are duplicated on the Mezzo Precision Microphone. Therefore, the Status, Sat, Run, Stop and Comment have the save functionalities.

3.16 Display Pane



Display Pane

3.16.1 Time Bar

Time Bar				
Control / Indicator	Description			
	This time slider gives time information about the measurement and the display data.			
17:40:57 21:00:00 00:00:00 08:10:54 14/08/11 14/08/11 14/08/12 14/08/12	• The leftmost and rightmost values: measurement start and stop time respectively.			
	• The grey cursors that enclose the blue span: the time span on the Time History graph.			
	• The yellow cursor: the time cursor on the Time History graph and the time used to display a value on the Spectrum graph or Stats Table.			
	The cursor can be moved directly from the slider control.			
	The magnifier buttons zoom in and out the span of the Time History. The arrow buttons shift left or right the span of the Time History.			
07:47:25 15/06/25	This control displays the current value of the time cursor on the slider (also the cursor on the Time History graph). The exact time value should be set here.			

3.16.2 Data Display

The Data Display area can display either a time history graph, a spectrum graph (1/3 octave or FFT) and a table.

Time History Graph



The Time History displays the selected data selected in the Display Menu. The time span of the graph is set from the Time Bar.

Time History Graph	
Control / Indicator	Description
TimeHisto Period1 (1min): 15/06/25 07:47:00 - 15/06/25 07:48:00 LAeq: 82,4dBA	 This legend gives the main information on the data being displayed: The graph type. The period (live or one of the averaging periods). The time span of the interval. The data name and the value of the cursor on the graph.
	The arrow buttons shift left or right the cursor on the graph.
OL UR UR	Overload and under range indicators are available for sound and vibration data. A red OL indicator indicates that an overload occurred. During measurement, the overload stays red as soon as an overload is detected until a new average period starts. In post-process, the overload is red if an overload occurred during the interval of the displayed data. A blue UR indicator indicates that an under range occurred. During measurement, the under range stays blue only while the under range is detected. In post-process, the under range is blue if an under range occurred during the interval of the displayed data.
- + -	This event graph shows when events occurred (types 1, 2, 3 and 4). Each event appears as a blue line. The cursor and time span match those on the main graph below. In post process, clicking on an event opens the Event Viewer interface (page 44).
Maximum Maximum 10 0 10 10 10 10 10 10 10 10 10 10 10 10	This button opens the Vertical Axis Format interface from which the vertical scale of the graph can be modified. The Minimum and Maximum fields can be set manually or automatically using the Auto-Scale Now button. With vibrations, the mapping mode allows displaying the axis in linear of logarithmic scale.

Spectrum Graph



1/3 Octave Graph display



The spectrum graph displays the data selected in the Display Menu. The time of the data can be set by moving the yellow cursor in the Time Bar.

Spectrum Graph

Control / Indicator	Description			
1/3Oct Period1 (10sec): 14/08/26 07:58:20 - 14/08/26 07:58:30 LAeq 1kHz: 43,8dBA	 This legend gives the main information on the data being displayed: The graph type. The period (live or one of the averaging periods). The time span of the data. The data name and the value of the cursor on the graph. 			
	The arrow buttons shift left or right the cursor on the spectrum and global graphs.			
OL UR UR	Overload and under range indicators are available for sound and vibration data. If the OL indicator is red, it indicates that an overload occurred. During measurement, the overload stays red as soon as an overload is detected until a new average period starts. In post-process, the overload is red if an overload occurred during the displayed average data. If the UR indicator is blue, it indicates that an under range occurred. During measurement, the under range stays blue only while the under range is			



OK Cancel



Table Display



Class	1 (X-Large)	2 (Large)	3 (Medium)	4 (Small)	5 (X-Small)	Overall	-
Closing-Count	1	19	28	2	0	50	
Closing-Mean Speed	78,1km/h	75,5km/h	75,8km/h	59,6km/h		75,0km/h	
Closing-Max Speed	78,1km/h	109,1km/h	114,1km/h	67,0km/h		114,1km/h	
Closing-Min Speed	78,1km/h	27,0km/h	19,4km/h	52,2km/h		67,0km/h	
Away-Count	0	27	78	31	0	136	
Away-Mean Speed		80,1km/h	90,0km/h	61,6km/h		81,5km/h	
Away-Max Speed		106,6km/h	156,2km/h	96,5km/h		156,2km/h	
Away-Min Speed		26,6km/h	19,4km/h	21,6km/h		26,6km/h	
Total-Count	1	46	106	33	0	186	
Total-Mean Speed	78,1km/h	78,2km/h	86,2km/h	61,5km/h		79,8km/h	
Total-Max Speed	78,1km/h	109,1km/h	156,2km/h	96,5km/h		156,2km/h	
Total-Min Speed	78,1km/h	27,0km/h	19,4km/h	52,2km/h		67,0km/h	

Table display - Traffic

Soft d	B Table Perio	d2 (30sed	:): 18/01/2	2 13:16:00 - 18/01/22 13:16:14 Dust	
	Avg N Concentration 0 Flow Rate 2 Temperature 2 Humidity 1 Barometer 1	Max 0,002mg/m ³ 0,01pm 11,6°C 5% 020,4mbar Tabl	Min 0,002mg/m ³ 2,01pm 21,6°C 16% 1020,5mbar e displa	0,001mg/m² 2,0lpm 21,6°C 15% 1020,3mbar ay – Dust	^
OL UR	Table Perio	od2 (30se	c): 18/01/	22 13:18:00 - 18/01/22 13:18:13 Gas	
	CO NO2 O3 CH4 NOX C6H6 H25 SO2	Average 10,2684mg/r 0,278868mg/ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³	Max 10,3106mg/r 0,279613mg/ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³	Min 10,2242mg/n 0,278114mg/ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³ NaNmg/m ³	^

The Table display the global values of SLM, OPL, vibration or any other available sensor.

Table display – Gas

Table Display			
Control / Indicator	Description		
StatsTable Period4 (1day): 14/08/12 00:00:00 - 14/08/12 08:10:54 LAF	 This legend gives the main information on the data being displayed: The graph type. The period (live or one of the averaging periods) The time span of the data The data name 		
OL OL UR UR	Overload and under range indicators are available for sound and vibration data. If the OL indicator is red, it indicates that an overload occurred. During measurement, the overload stays red as soon as an overload is detected until a new average period starts. In post-process, the overload is red if an overload occurred during the displayed average data. If the UR indicator is blue, it indicates that an under range occurred. During measurement, the under range stays blue only while the under range is detected. In post-process, the under range is blue if an under range occurred during the displayed average data.		

Vib Histo Graph



The Vibration History displays the selected vibration data selected in the Display Menu. The time span of the graph is set from the Time Bar. Rather then display the level vs time (time history), this graph displays the level vs frequency. The data in the 3 axes are shown as dots as indicated in the legend. A bold cross appears over the dot corresponding to the selected time.

3.17 Event Viewer Interface



Event Viewer Interface

The Event Viewer allows reviewing the event in detail using the audio signal, the pictures the average data and/or the waveforms. To launch the Event Viewer interface, click on an event in the event graph above the time history graph to view the selected event. The button can be used to export the event components into standard files.